Total System Performance – The Way Ahead

NUWC HSI Symposium
4 May 2004

Greg L. Maxwell
Human Systems Integration SEA 03

HUMAN SYSTEMS INTEGRATION

SEA 03 Functional Responsibilities

- **HSI Alignment**
  - CFFC, OPNAV (N00T), NETC (HPC), NPDC (Learning Centers), Fleet
- **HSI Technical Authority/Program Certification**
  - Policy, standards, best business practices
  - Performance Metrics, HSI Plans, Modernization
- **HSI Requirements**
  - ICD, CDD, AoA Concept Development
- **HSI Technology Investment, Assessment, Transition**
  - Human performance implications

Human Performance is…

A critical determiner of mission success for complex, technology-driven, optimally-manned ships and systems of the 21st century, derived from a comprehensive top-down functional analysis of warfighting requirements

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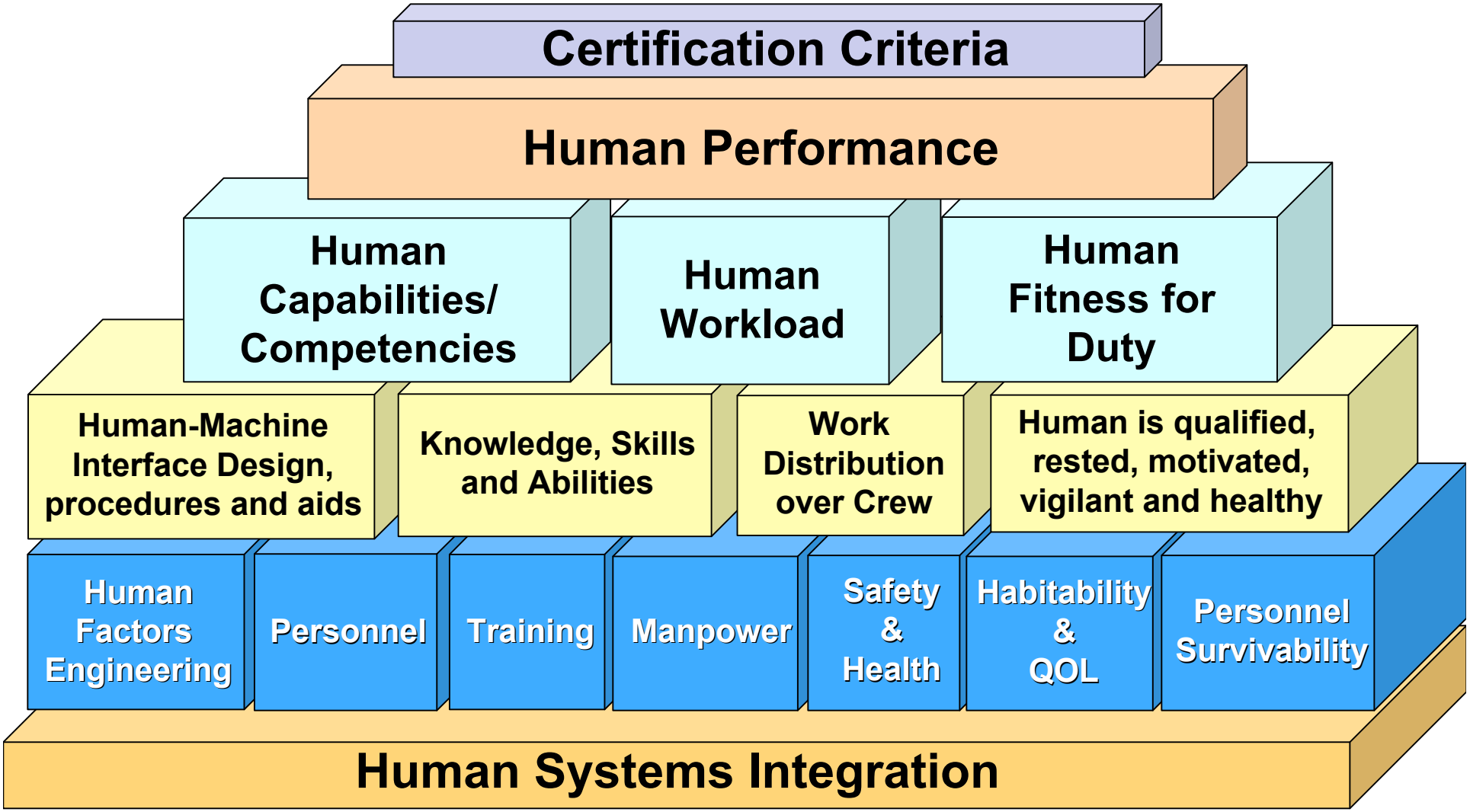
Manpower Requirements

Knowledge, Skills, and Abilities (KSAs) to Execute Human Functions and Tasks

Tailored Training

Building Blocks of Human Performance



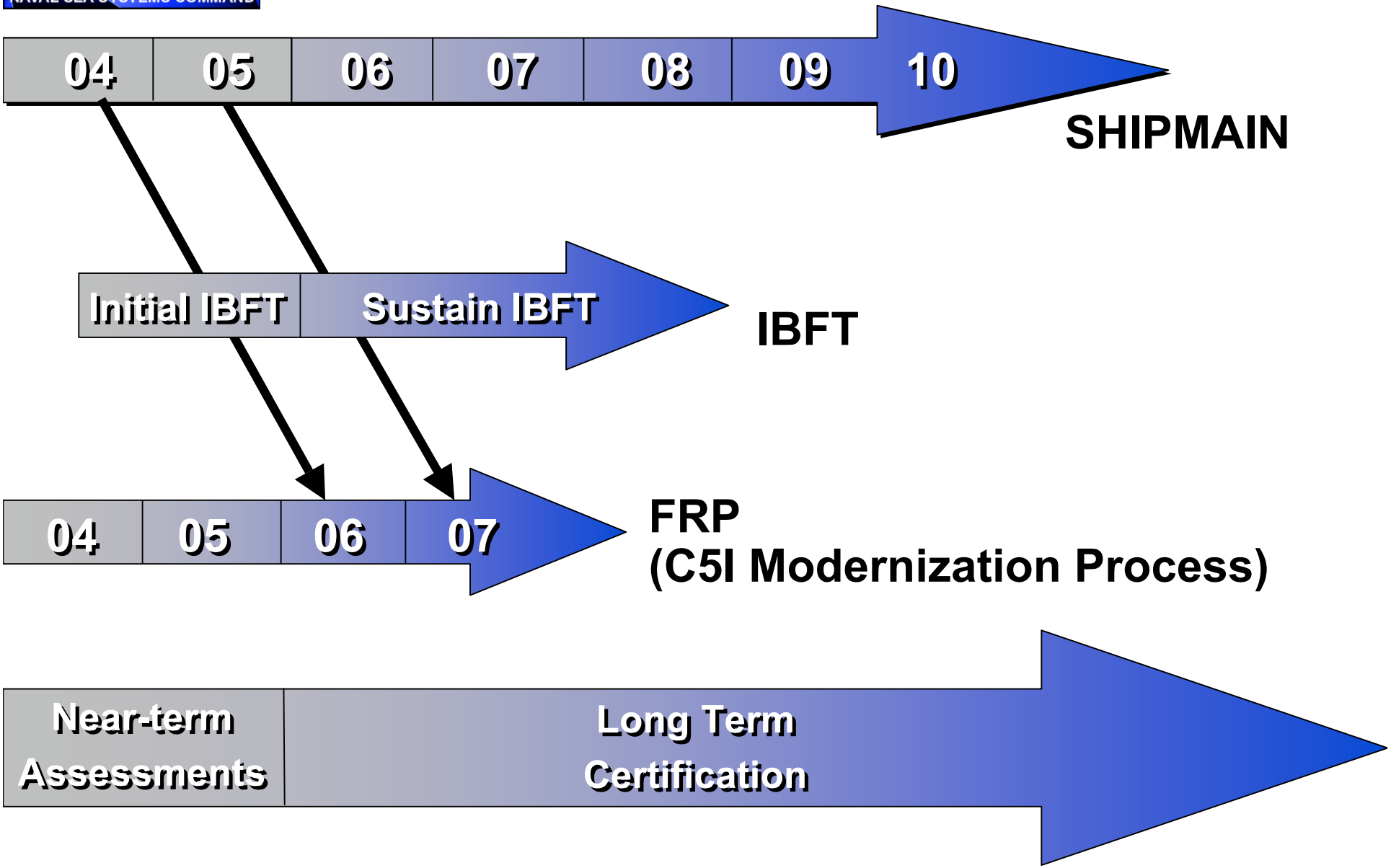
Human Performance Metrics

Human Performance	Total Ship Design	Subsystem Design	Modernization
λ Time to Complete	X	X	X
λ Accuracy	X	X	X
λ Availability	X	X	X
λ Workload – Cognitive and Physical	X	X	X
λ Situational	X	X	X
Fitness for Duty			
λ # of hours continuously on watch / duty	X	X	X
Personnel and Training			
λ # of billets that require special skills	X	X	X
λ Time & cost to train to specified proficiency	X	X	X
Manpower			
λ # of work hours = X billets	X		
System Design			
λ Human engineering design compliance	X	X	X

Program Performance Metrics

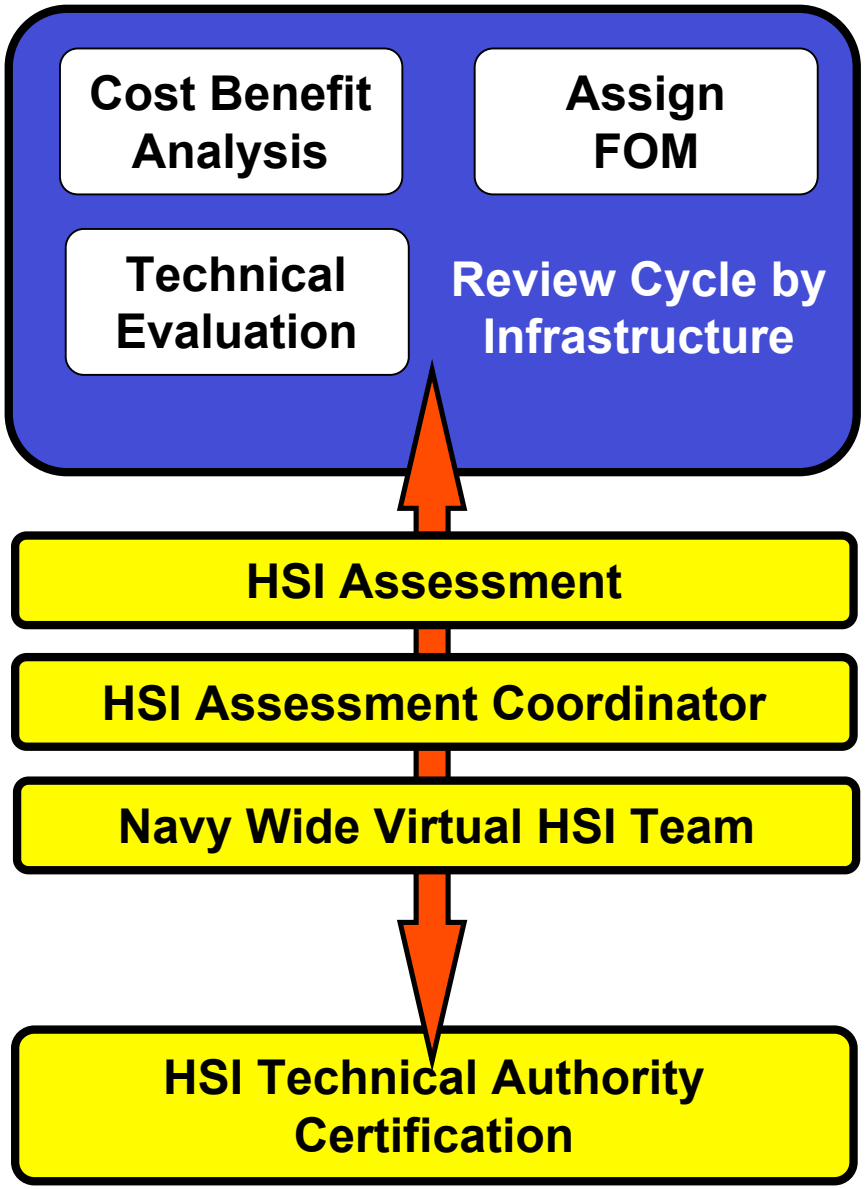
		Total Ship Design	Subsystem Design	Modern-ization
Program Management	HSIP	X	X	X
	Integration with Systems Engineering	X	X	X
Funding	FYDP	X	X	X
Human Factors Engineering	ASTM F1166, MIL-STD 1472F	X	X	X
	Task Analysis, Human Performance Metrics	X	X	X
	Top-Down Requirements Analysis (TDRA)	X	X	
Manpower	TDRA/Workload Analysis	X	X	X
Personnel	KSAs, Occupational Specialties	X	X	X
Training	KSAs, Workload and Task Analyses	X	X	X
	TRPPM/NTSP	X	X	X
Survivability	Anti-Fratricide	X	X	X
	Egress	X		X
ESOH	PESHE, Hazard Analysis	X	X	X
Habitability	OPNAVINST 9640.1A	X	X	X

HSI Certification Authority Alignment



SHIPMAIN HSI Evaluation

"Entitled Process" Review Cycle



HSI v-Team:

- **ASSESS** Impact on Sailor Skills, Workload, and Performance
- **ASSESS** Integration of Hardware, Software, and People

HSI Technical Authority:

- **CERTIFY** System Optimized for Sailor Performance

Results:

- Enhanced Sailor Performance
- Improved Training
- Common Assessment and Certification Process for New Acquisitions and Modernization
- Support for "Culture of Readiness"

SEA 03 Accomplishments

Technical Authority/Certification

- Certified DD(X) HSI to proceed to CDR
- Conducted HSI Technical Feasibility Assessment of LCS
- Conducted Program Reviews for LCS, CG Modernization, and CVN 21
- Developed SHIPMAIN/C5I HSI certification criteria
- Defined HSI Technical Authority Pyramid
- Promulgated HSI in Acquisition and Modernization Instruction (NAVSEAINST 3900.8A)
  - Common Program/Human Performance Metrics

SEA 03 Accomplishments (Cont)

Alignment

- Established process with CFFC and HPC to define technical solutions for Fleet HP issues
- Approved Virtual SYSCOM HSI MOA
  - Developing Common Presentation Layer for LCS mission modules
- Defined objectives for Integrated Navy HP lab
- Established HSI in Acquisition as a Sea Warrior Component
  - Introduced program management discipline in TF Warrior
  - Developed Business Rules for ILE
  - Filled 4 of 5 technical positions in Navy learning centers

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Sea Warrior

- Optimize warfighting performance
- Focus on warfighter as the key element of the system
  - *Design hardware/software around Sailors' capabilities and limitations*
  - *Optimal manning solutions based on tasks and workload allocated to the Sailor*
  - *Seamless and tailored training based on skills analysis*

Key Component of the Warfighting System

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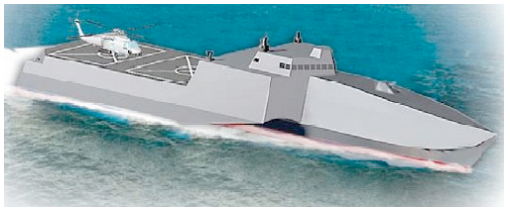
SEA WARRIOR

Sailor Performance and Professional Development

Optimal Sailor Performance



SEA WARRIOR …Sailor performance delivering → **SEA POWER 21**

Sea Warrior
Achieving Tailored Training

Human Systems Integration

Revolution in Training

Connection is:

Business Rules & Standards

TDFA Functions Tasks Skills

Skill Objects

SYSCOMS

HPC

NAVMAC

NETC/NPDC

HPC

NAVMAC

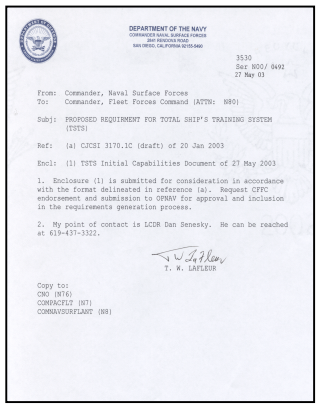
Blended Solution

Human Performance Metrics

Tailored Training Solutions

Total Ship Training Architecture

Evolution of Training Systems



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3530
Ser N00/ 0491
27 May 03

From: Commander, Naval Surface Forces
To: Commander, Fleet Forces Command (ATTN: N80)

Subj: PROPOSED REQUIREMENT FOR TOTAL SHIP'S TRAINING SYSTEM (TSTS)

Ref: (a) CJCSI 3170.1C (draft) of 20 Jan 2003

Encl: (1) TSTS Initial Capabilities Document of 27 May 2003

1. Enclosure (1) is submitted for consideration in accordance with the format delineated in reference (a). Request CFFC endorsement and submission to OPNAV for approval and inclusion in the requirements generation process.

2. My point of contact is LCDR Dan Senesky. He can be reached at 619-437-3322.

T. W. LAFLEUR

Copy to:
CNO (N76)
COMPACFLT (N7)
COMNAVSURFLANT (N8)

TSTA ICD

TSTA

CVN 21

DD(X)

LCS

LPD 17

BFTT

OPEN ARCHITECTURE

Sea Trial

Sea Warrior

Sea Enterprise

Sea Shield

FORCEnet

Sea Strike

Sea Basing

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